Annex to:

EFSA NDA Panel, 2022. Scientific Opinion on the Tolerable Upper Intake Level for dietary sugars (EFSA-Q-2016-00414). EFSA Journal 2022;20(2):7074. doi:10.2903/j.efsa.2022.7074

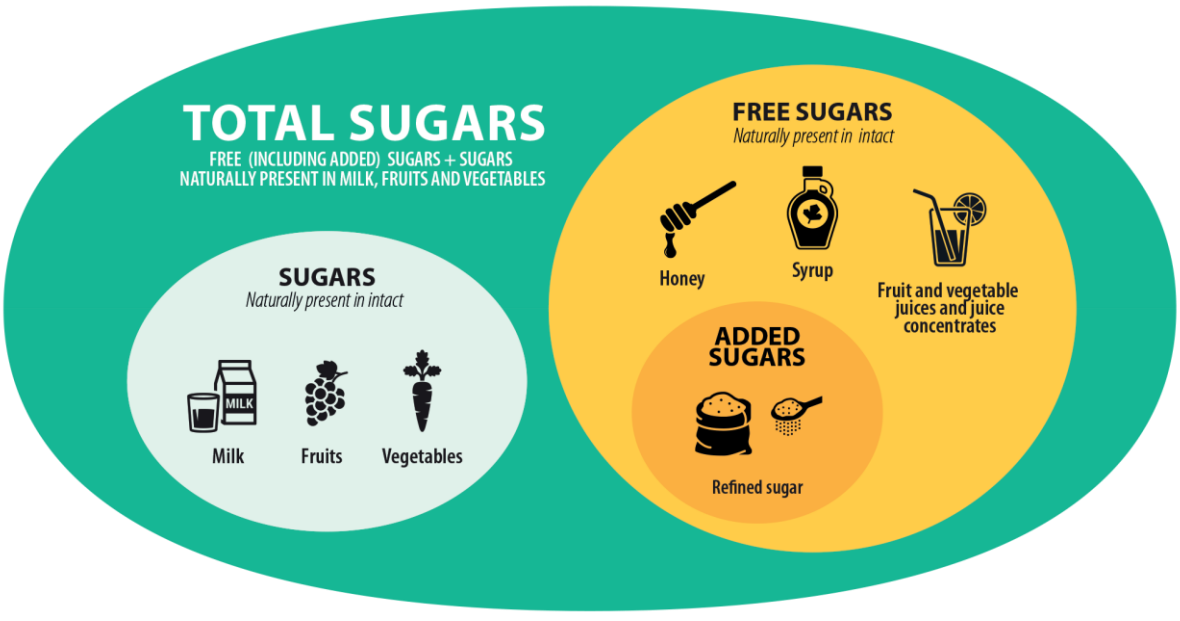
Tolerable Upper Intake Level for dietary sugars

Disclaimer

- The present plain language summary (PLS) is a simplified communication of EFSA's opinion on the safety of dietary sugars.
- The purpose of this PLS is to enhance transparency and inform interested parties about EFSA's work on the topic, using simplified language.
- Anyone interested in the more analytical results and interpretation should consult the full EFSA opinion, which can be found here.

Dietary sugars – an overview

- Our diet contains three main categories of sugars (dietary sugars):
  - Added sugars are those added to foods during processing, cooking etc., eaten separately, or added to food at the table;
  - Free sugars include added sugars and those naturally present in honey and syrup, as well as those released during the juicing of fruits and vegetables (e.g., in juices and juice concentrates);
  - Sugars naturally present in intact milk, fruits, and vegetables.



- The combination of all categories of dietary sugars is the total amount of sugars we eat in our diet.
- Sugar consumption is known to cause dental caries (cavities).

- Sugars consumed in excess are stored in the body as fat for later use. If these stores are not used, they can build up over time and lead to health problems, such as obesity, liver disease, hypertension, cardiovascular disease, and type 2 diabetes.

What was EFSA asked to do?

- **EFSA is responsible** for providing independent scientific advice on nutrient intakes to EU risk managers and policy makers.
- EFSA was asked by five European Nordic countries to set a science-based Tolerable Upper Intake Level (UL) for dietary sugars from all sources (i.e. through the diet).
- A UL is the maximum amount of a nutrient that can be consumed safely over a long period of time
- **EFSA was not asked** to recommend how much sugar consumers should include in their diet as it **is not responsible** for establishing nutrition goals for populations or recommendations for individuals.
- This is a task for national public health authorities supported by international bodies like the World Health Organization (WHO).
- In 2010, EFSA could not derive a UL for added sugars even though adverse effects had been reported in relation to the consumption of sugar-sweetened beverages and increased body weight, mostly in children.

How did EFSA carry out this work?

- In response to the request, the EFSA Panel on Nutrition, Novel Foods, and Food Allergens (NDA) collected, studied, and analysed the necessary data and information using relevant published literature.
- The NDA Panel is a multidisciplinary group of expert scientists.
- The Panel's expertise offers in-depth scientific understanding and necessary technical skills to evaluate the adverse effects of dietary sugars and consumer exposure to sugars.

The experts developed a protocol to define upfront how the assessment would be conducted. This was opened for public consultation and amended based on the comments received from stakeholders:

i. The methodology was based on the principles and processes illustrated in the EFSA PROMETHEUS project.
ii. A 4-step approach was applied: hazard identification, hazard characterisation, intake assessment and risk characterisation.
iii. The Approach for Systematic Review and Evidence Integration developed by the Office of Health Assessment and Translation of the US National Toxicology Program was adapted to the specific case.
iv. The methodology was used to appraise the reliability of eligible studies and to formulate conclusions on hazard identification, accounting for the uncertainties identified in the body of evidence.

As stipulated in the protocol, the NDA Panel:

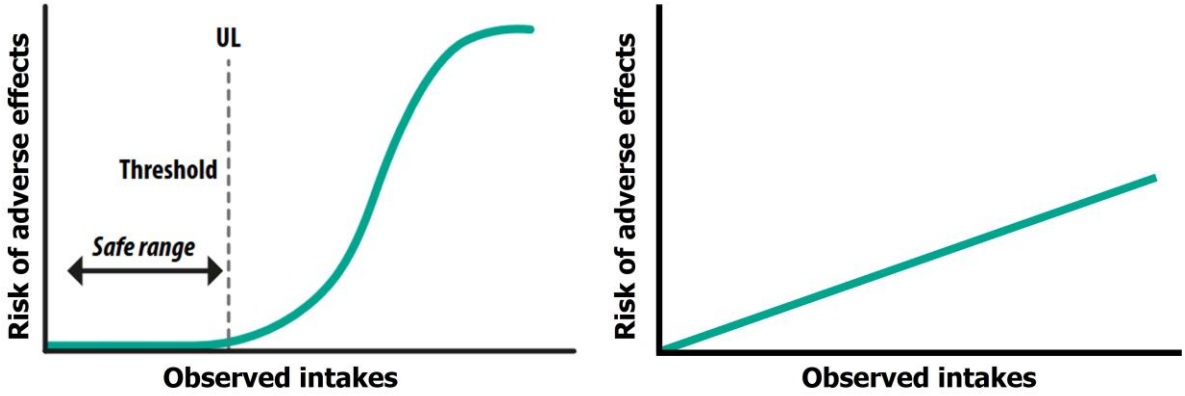
- Conducted systematic reviews of the literature and screened over 25,000 scientific papers in July 2018, then an additional 7,500 in August and October 2020.
- Identified 120 eligible studies linking intake of sugars and risk of chronic metabolic diseases, pregnancy-related effects, and dental caries.

- Estimated the intake of dietary sugars from the whole diet and from different categories of food using harmonised food consumption data from dietary surveys in 25 European countries, covering some 135,000 individuals.

What are the outcomes?

The Panel provided expert opinion on the potential for setting a UL for dietary sugars:

- It confirmed the links – to varying degrees of certainty – between intake of dietary sugars and a range of health problems.
- It is not possible, however, to set a science-based UL for dietary sugars (either total, added, or free sugars).
- The Panel could not set a 'safe level of intake' either.
- This is because the risk of adverse health effects (responses) increased across the whole range of observed intake levels (doses) in a constant (linear) manner, i.e. the higher the intake, the greater the risk of adverse effects.



Caption: In the typical relationship (left) between excessive intakes of nutrients and adverse health effects, the bottom of the curve represents the safe range of intakes based on observed intakes that do not lead to adverse effects. As the curve rises, the risk of adverse effects increases. The UL marks the threshold beyond which adverse health effects are likely to occur. In a linear curve (right), it is not possible to identify this safe range of intake, and the respective UL, as the risk of adverse effects increases continuously across the whole range of observed intake levels.

What were the limitations?

EFSA's scientific assessments always consider the uncertainty of the presented results while making their judgment using quantified and non-quantified sources of uncertainty. For this assessment, uncertainties include:

- Food composition data collected in 2012 may not reflect current food formulations well.
- Dietary surveys with few consumption days may not reflect habitual intakes well.
- There are few studies on free sugars and it is not possible to assess added and free sugars separately.
- Many studies did not quantify sugars from specific food groups meaning it was only possible to calculate intakes from beverages.
- The energy and non-energy contribution (i.e., the molecule-specific effects) of dietary sugars from different sources to metabolic disease risk could not be systematically addressed across studies and disease endpoints.

- The relationship between the intake of added and free sugars and the risk of chronic metabolic diseases could not be adequately explored at levels less than 10% of total calorie intake owing to the low number of studies available.

Implications and recommendations for Public Health Authorities

- When providing dietary advice, public health authorities should:
    a. Consider that the intake of added and free sugars should **be as low as possible** in the context of a nutritionally adequate diet.
    b. Take account of the nutritional status, the actual composition of available foods, and known patterns of intake of foods and nutrients of their populations.
- The lowest amount of added/free sugars that is compatible with a nutritionally adequate diet in Europe may vary across population groups and countries.